M2000

Installation Instructions

COOPER Security

MENVIER SECURITY

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Cooper Security Ltd.,
Security House,
Vantage Point Business Village,
Mitcheldean,
Gloucestershire,
GL17 0SZ
England

Product Support (UK) Tel: +44 (0)1594 541979
Available between:
08:15-12:30 and 13:00-17:00 Monday to Friday.
Product Support Fax: +44 (0)1594 545401

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Introduction

Figure 1 and Figure 2 show the layout of the control panel and the main features of the printed-circuit board (PCB).

The panel includes a wealth of features, including:

- Eight on-board zones.
- Two network ports for the connection of keypads, MSNodes and MRNodes (see Figure 3). The additional network devices enable the system to be expanded up to 264 zones.
- Serial and USB connectors for local connection of a PC running the Downloader configuration and monitoring software.
- An on-board modem connected to PSTN and RJ11 ports to enable remote connection to a remote alarm receiving centre or to a PC running the Downloader software.
- Switched-positive, switched-negative and voltage-free programmable outputs.
- 16-channel digital communicator outputs for connection to an alarm receiving centre or to provide additional programmable outputs.
- Engineer keypad port.
- CPA6 output port to provide additional programmable outputs.
- Serial printer port.

This leaflet describes how to install the control panel. If you need a general overview of its features, please refer to the *M2000/M800/M750 Engineering Manual*. If you require details of how to install keypads or other ancillary devices, please refer to their separate installation instructions.

At the publication of this manual, the MKP1, CPA6, MIDNode and IDNode are no longer available for sale. This manual includes details of these products in case you are fitting a M2000 control unit to older M-series alarm systems with these products.

Note: Before connecting any external devices to the control panel, make sure that it is able to provide sufficient current to power such devices, as described on page 14.

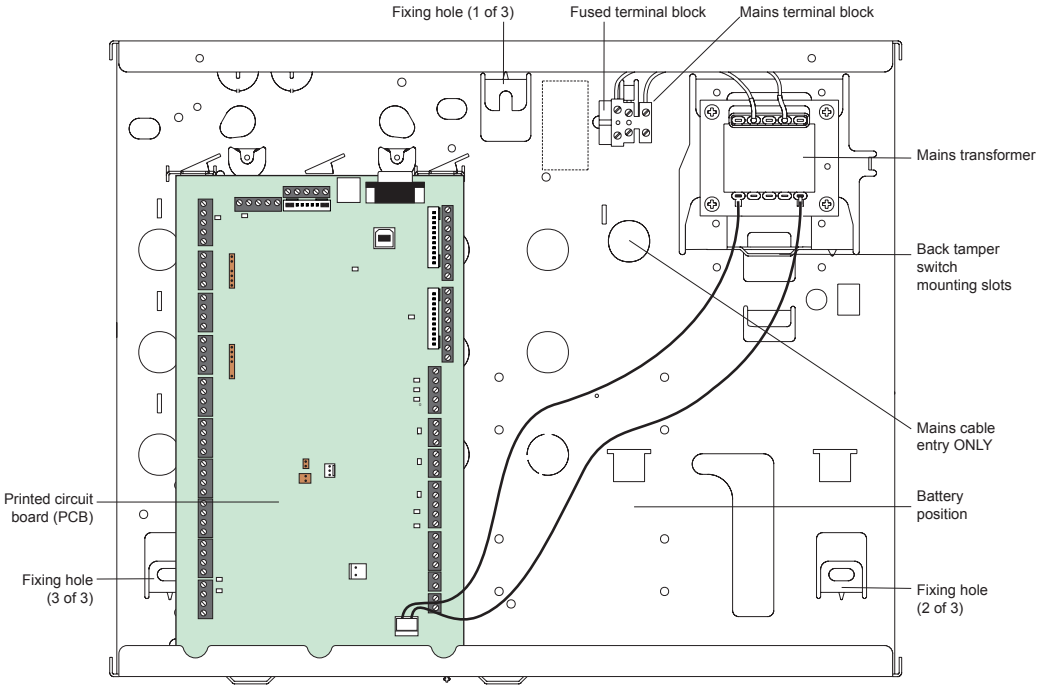


Figure 1: Control Panel Layout

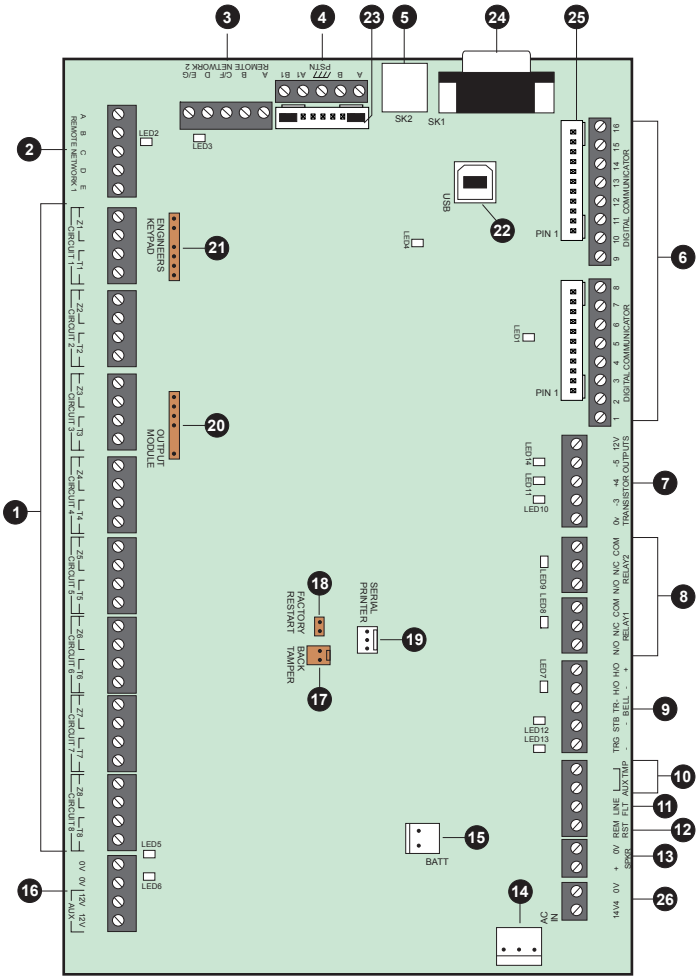


Figure 2: Control Panel PCB

Ref	Description	See Page	Ref	Description	See Page
1	Zone connectors	6	15	Battery connector	12
2	Network 1 connector	8	16	12Vdc Auxiliary power terminals	12
3	Network 2 connector	8	17	Back tamper connector	12
4	PSTN (Telephone) terminals	8	18	Factory restart connector	12
5	RJ11 (Telephone) socket	8	19	Serial printer connector	13
6	Digital communicator outputs	9	20	Output module connector	13
7	Transistor outputs	10	21	Engineer keypad connector	13
8	Relay outputs	11	22	USB connection to a PC	13
9	External bell/sounder connections	11	23	ADSL filter conector	8
10	Auxiliary tamper input	11	24.	Serial (RS232) connection to a PC	13
11	Line fault input	11	25.	Connectors for 8600 Relay Card	10
12	Remote reset input	12	26.	14.4V Siren output	11
13	Extension loudspeaker connections	12	LEDs 1-14		15
14	AC input connector	12	Polyfuses		15

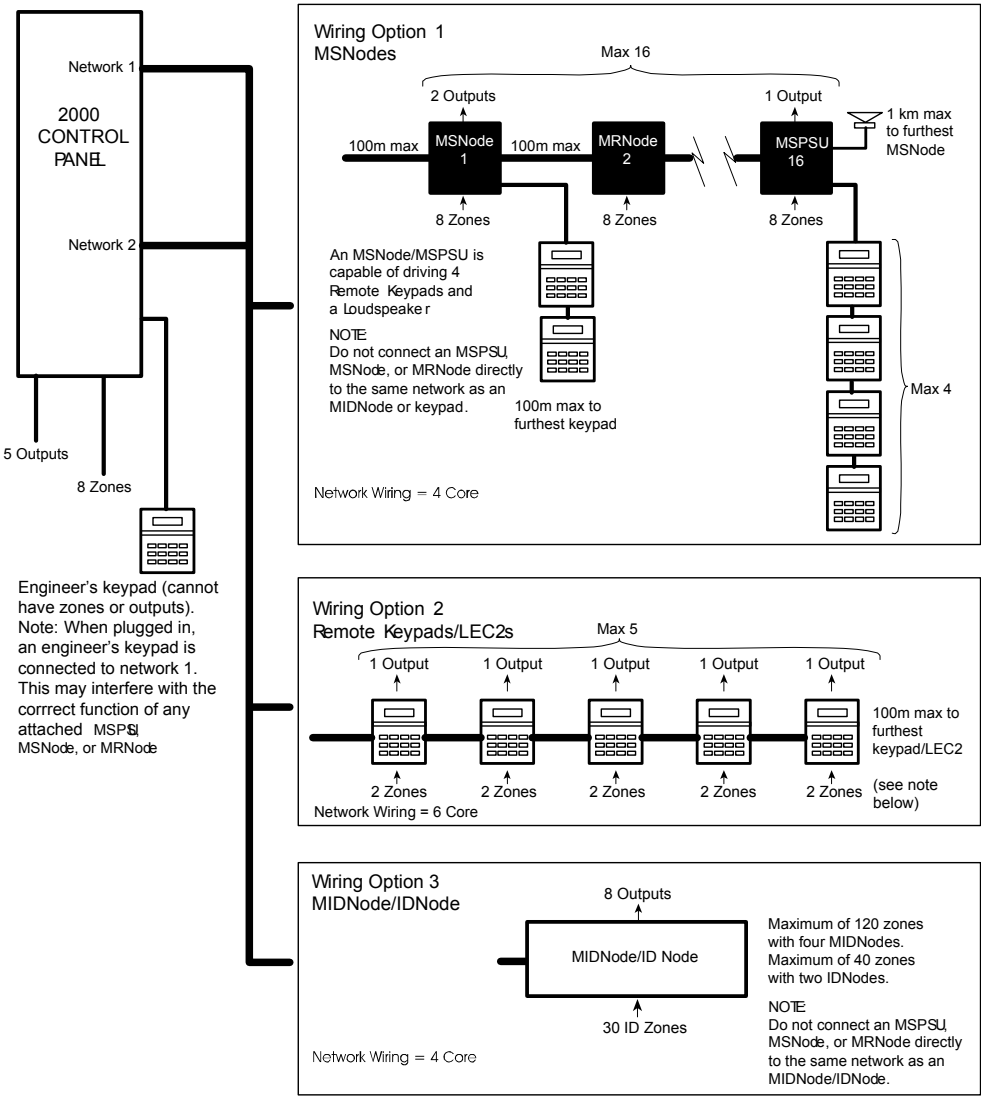


Figure 3: Overview of Network Wiring Options

Note:

- Using a Networker Interface Board (NIB) (with power supply) enables the maximum distance from a control panel to an ID Node or keypad to be increased to 1km.
- The supply voltage at each Network 1 or 2 device must not drop below 10.5V (Cooper Security recommend that for reliable working while mains power is present you should ensure that the voltage at each device is above 12.0V). Refer to the M2000/M800/M750 Engineering Manual for details of how to calculate and overcome voltage drops.
- Direct connection of an LEC6 (6-zone) expander to Network 1 or 2 is supported for existing systems that are being upgraded. Ensure that the number of zones does not exceed the number that would be provided by keypads alone.

Fitting and Wiring Procedure

To install the control panel:

1. Remove the front cover by releasing its three retaining screws and disconnecting the earth bonding cable from the spade connector on the transformer.

   Warning: mains voltages may be present at the mains terminal block (see Figure 1).

2. Connect any optional modules to the PCB.
3. Slide the back tamper switch mounting plate into the slots shown in Figure 1.
4. Route all cables through the cable-entry holes located on the base of the control panel. All holes used must be fitted with a rubber grommet to protect against sharp edges. The mains cable must use its own cable-entry hole.
5. If required, secure the control panel to a wall using not less than 30mm x No 10 screws through the three fixing holes shown in Figure 1.
6. Connect all wiring except to the standby battery (connect during power-up procedure).

General Wiring Considerations

Cable Type

In general, the control panel requires standard 7/0.2 un-screened alarm cable for wiring to MSNodes, MRNodes, keypads, LEC2s, ID Nodes and zone sensors. The number of cores varies, depending on the device being connected.

Screened cable may prove necessary if the installation site has equipment that produces high levels of R.F. (Radio Frequencies), e.g. heavy industrial plant such as welding equipment, etc. If screened cable is required, you should adhere to the following guidelines:

1. The screen on the cable should be connected only to mains earth at the control panel to avoid earth loops.
2. The continuity of the cable screen is most important and screens MUST be continuous along the full length of the network.
3. If the network cable enters any metal enclosure, ensure the screen is isolated from the case.

Cable Segregation

All network and zone wiring must be segregated from any other wiring, such as mains supply cables, telephone cables, computer network cables and R.F. cables. It is recommended that cable ties are used to keep cables separated.

The network and detection cables should be kept clear of cables supplying sounders or extension loudspeakers. It is also advisable to avoid running more than one network down a single cable.

Cables Routed inside the Control Panel

Cables routed inside the product, must be:

- Kept as short as possible.
- Routed close to the housing.
- Kept as far as possible from the electronics.

Initial Power-Up Procedure and Checks

1. Place a small screwdriver blade between the FACTORY RESTART terminals ("18" on Figure 2). When you switch on the mains, this will ensure that the factory default settings are used, as documented in the *M2000/M800/M750 Engineering Manual*.
2. Switch on the mains supply and remove the screwdriver blade only when the heartbeat LED (LED1, next to the Digital Communicator terminals) flashes. This may take up to 30 secs.
3. Check that the power LED on the control panel PCB is lit. The keypad sounders and extension loudspeakers will operate (tamper alarm).
4. Enter your engineer passcode (default 1234). The sounders are silenced and the system prompts to confirm the network devices used (as described in the *M2000/M800/M750 Engineering Manual*). Press [ESC] to enter the Engineering menus.
5. Connect the standby battery.
6. Switch off the 230V mains supply and ensure that the DC voltage at each device on each network is greater than 10.5V while the system is powered from its standby battery.
7. Switch on the mains supply and measure the DC voltage between the mains earth connection and AUX +12V ("16" on Figure 2). ***Warning: Do not make contact with live or neutral!***

   Then measure the DC voltage between the mains earth connection and 0V. In both cases, the measurement should be 1V or less. If the voltage is greater than 1V, the system has an "Earth Fault" and all cables should be checked for isolation to earth.
8. Replace the cover of the control panel.
9. Use the Engineer menu options to set up the system, as described in the *Engineering Manual*.
10. Test system operation.

Zone Wiring

("1" in Figure 2.)

The control panel has a set of eight on-board terminal blocks for the connection of alarm sensors, such as door contacts and PIR detectors.

Each terminal block can connect to one or more sensors, wired using either the double-pole (also known as Closed Circuit Loop, CCL) method (see Figure 4) or Fully Supervised Loop (FSL) method (see Figure 5).

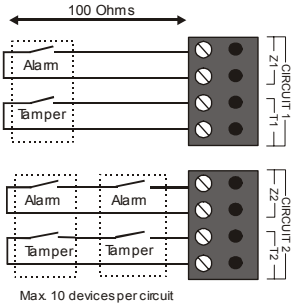


Figure 4: Zone Wiring (Double Pole/CCL)

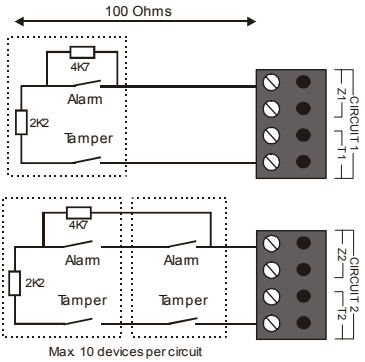


Figure 5: Zone Wiring (FSL)

By default, alarm contacts are normally closed. When programming zones with normally-open contacts give them the "Inverted" attribute.

The FSL method uses resistors at the end of the line and across the alarm contact, which enables the cables to be supervised for short-circuit or open-circuit conditions to guard against cable tampering. The resistors can have the values shown in Table 1 (the values used must be specified when programming the zone).

Alarm Shunt Resistor (±5%)	End-of-Line Resistor (±5%)
4K7	2K2
1K0	1K0
4K7	4K7
2K2	2K2

Table 1: Resistors for Zones Wired using the FSL Method

When using the FSL method, two cores are used for each zone. When using the double-pole method, four cores are used.

It is recommended to use only one detector per zone, otherwise when an alarm or tamper condition arises, the source of the alarm/tamper is not known.

If you are powering devices such as PIR detectors from the control panel, an additional two cores are required for connection to the 12Vdc power output terminals (labelled "16" in Figure 2).

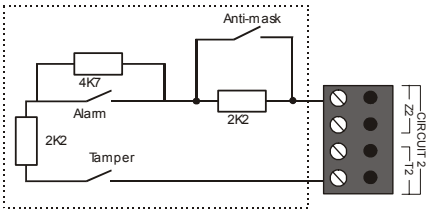
Whichever method is used, the wiring resistance must be less than 100 Ohms (with the end-of-line resistor shorted in the case of the FSL method).

If you are not using a zone, you should program the zone as "Not Used".

Anti-Masking Zone Connections

Some PIR detectors are fitted with an anti-masking facility to detect cases where the detector has been obscured. Depending on the type of detector, the masking status is conveyed by one of two methods:

- By an open/closed contact wired to a separate zone programmed as type "Masking". Two zones are therefore needed: one for the masking status and the other for alarm/tamper status.
  The sensor can connect using the double-pole or FSL method. If double-pole is used for the Masking zone, the zone's tamper terminals must be shorted at the panel.
- By a specified resistance value to a zone (e.g. Normal Alm or 24 Hour). The zone must be wired as shown in Figure 6, which also shows the resistance values used to convey the normal, alarm, masking and tamper status. The zone must have the "Masking" attribute.



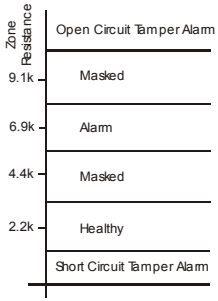


Figure 6: Anti-Masking Zone Wiring

Network Connections

Network 1 and 2 Connections

("2" and "3" in Figure 2.)

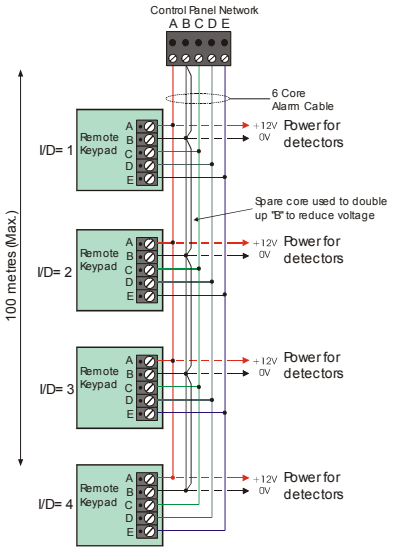


Figure 7: Keypad Connections

Networks 1 and 2 can connect to one of the following (see Figure 3):

- A combination of up to five keypads and/or LEC2s. Wiring is the same as in Figure 7.
- A maximum of 16 MSNodes, MSPSUs, or MRNodes. Please refer to the Installation Instructions for each device for connection details.

Note: Do not connect MSNodes, MSPSUs or MRNodes directly to the same network as a keypad, LEC2 or ID Node/MIDNode.

Telephone Connections

("4" and "5" in Figure 2.)

An M2000 contains a built-in modem. This enables direct connection to a PSTN telephone network or PABX exchange.

This allows the system to be controlled and monitored from a remote PC running the Downloader software, and enables alarm status information to be transmitted to an Alarm Receiving Centre.

You can connect the control panel to a telephone network using either of the following:

- The RJ11 telecom socket (labelled "5" in Figure 2). Use only a pre-manufactured and approved cable between the RJ11 socket and telephone outlet socket.
- The PSTN terminal block (labelled "4" in Figure 2). Connection details are shown in Figure 8. ***Do not make any other connections to the telephone network.***

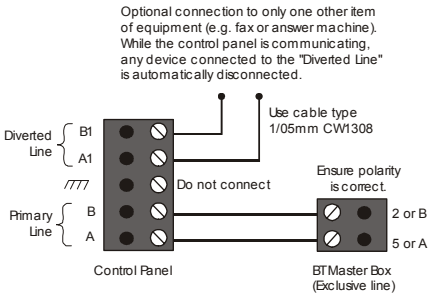

Optional connection to only one other item of equipment (e.g. fax or answer machine). While the control panel is communicating, any device connected to the "Diverted Line" is automatically disconnected.
Diverted Line
B1
A1
Use cable type 1/05mm CW1308
Do not connect
Ensure polarity is correct.
Primary Line
B
A
2 or B
5 or A
Control Panel
BT Master Box (Exclusive line)

Figure 8: PSTN Connections

The control panel is not suitable for connection as an extension to a payphone or to "1+1" carrier systems.

If required, you can fit an ADSL line filter to the connector immediately behind the PSTN terminal block. Cooper Security Ltd supply part number ADSL01 for this purpose. Before fitting the filter remove the jumpers from the connector as shown in Figure 9 below.

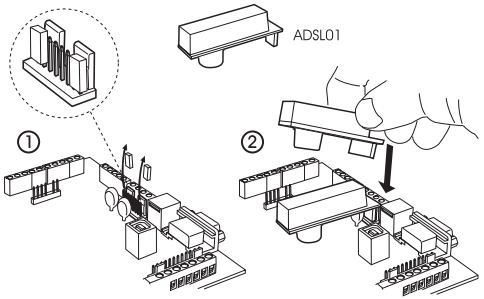


Figure 9. Fitting ADSL Filter ADSL01

Note: Make sure that you refit the jumpers to the pins shown in Figure 9 if you remove the ADSL filter. If you leave the jumpers off the telephone line will be disconnected.

The control panel has a Ringer Equivalence Number (REN) of 0.2. For any one line, the sum of REN values should not exceed 4.

Note: If you are in any doubt regarding connection to the telephone network, seek advice from a competent telephone engineer. If you are using the PSTN terminal block, the wiring should be carried out by an installer authorised by the network supplier (e.g. British Telecom).

Approved Usage

This product is manufactured to meet all European Economic Area telecommunication networks requirements. The equipment has been tested and conforms to ETSI TBR 21 and the associated ATAAB Advisory Notes.

In the event of problems, first check to confirm the functionality of the line, then contact your equipment supplier/installer.

The built-in modem has been approved for the following usage:

- Automatic call initialisation and dialling.
- Operation in absence of proceed indication.
- Modem.
- Serial connection.
- Multiple repeat attempts.
- Line Status Monitoring.

Usage other than approved usage or failure to comply with the instructions may invalidate any approval given to the apparatus, if, as a result, the apparatus ceases to comply with the standards against which approval was granted.

Digital Communicator Outputs

("6" in Figure 2.)

The control panel provides 16 programmable outputs, which could be used to operate a digital communicator – a device that transmits the status of each channel to an Alarm Receiving Centre (where each channel could represent a zone alarm status).

In addition to the screw terminals, the pcb also provides two sets of pins for two plug-on wiring harnesses (part number 485210). The bottom set of pins provide communicator outputs 1 to 8 plus 0V and 12V. The top set of pins provide communicator outputs 9 to 16 plus 0V and 12V. See Figure 10.

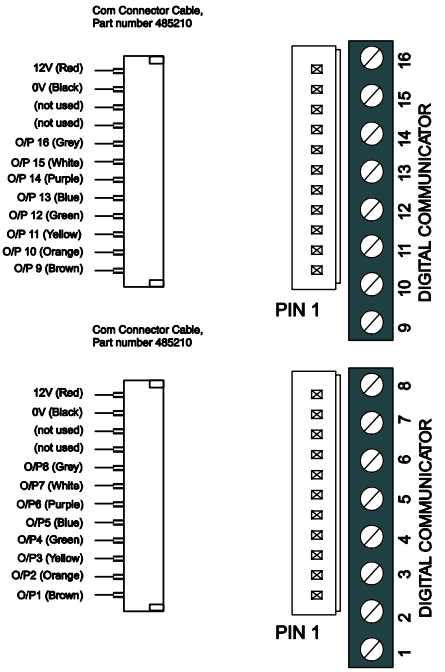


Figure 10.

Alternatively, low-power devices such as LEDs could be switched on or off by these outputs (see Figure 11).

By default, each output is switched negative, i.e. normally at +12Vdc and switches to 0V when active. When at 0V, up to 100mA can flow into the output from an external source.

If required, the sense can be reversed during system configuration, i.e. normally at +0V and switches to 12Vdc when active. In this case, when switching to +12Vdc, each output can deliver up to 5mA to an external load.

The terminal block labelled "7" in Figure 2 can provide a +12Vdc supply to a digital communicator. If this

used, the digital communicator must be housed within the control panel, since the +12Vdc output is unfused.

If required, you can use the 8600EUR-00 Relay Expansion Card to provide eight voltage free relay contacts, driven by the digital communicator outputs. See the 8600 Installation Instructions for details.

Note that the hardwired digital communicator outputs are defaulted to +12V inactive 0V active (+ve removed). This will energise the relays on the 8600. If you wish to change this use option 1-9-1-07 to invert the digi outputs.

Transistor Outputs

("7" in Figure 2.)

The programmable transistor outputs provide control for external equipment such as LEDs, buzzers and relays. The following outputs are provided:

- Two switched-negative outputs (-3 and -5). Each can switch from 12Vdc to 0V on activation, and is able sink up to 500mA from a 12Vdc source. See Figure 11 for examples.
- One switched-positive output (+4). This switches from 0V to 12Vdc on activation, and can deliver up to 500mA to an external load. See Figure 12 for examples.

Each output can be programmed to activate when, for example:

- There is an alarm in a specified zone.
- There is a panic alarm.
- Mains is disconnected from the control panel.
- A specified user passcode is entered.
- A combination of specified conditions occur.

The *M2000/M800/M750 Engineering Manual* provides full details of output programming.

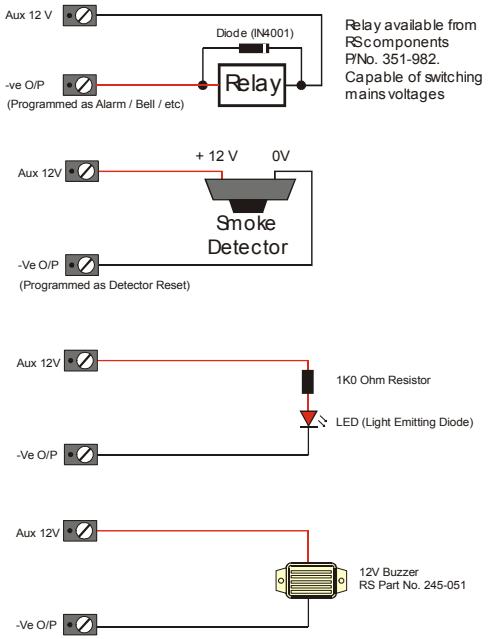


Figure 11: Examples of using Switched-Negative Outputs

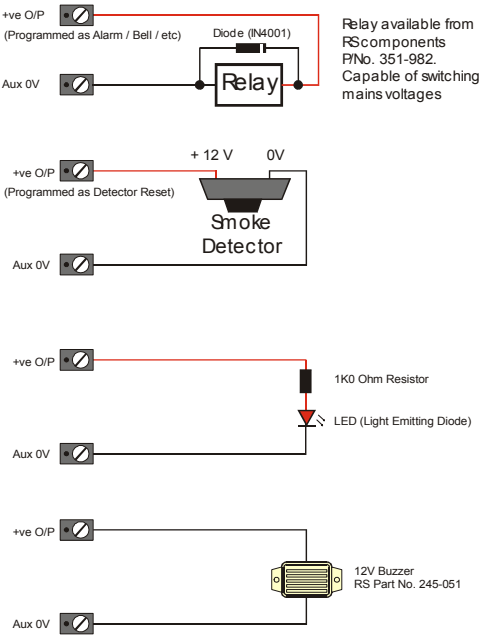


Figure 12: Examples of using Switched-Positive Outputs

Relay Output

("8" in Figure 2.)

The two relay outputs provide voltage-free changeover contacts, which can be programmed to switch external equipment on or off.

Connect one side of the external device to the COM terminal, and the other to either N/O or N/C. The effect is as follows:

- If you connect to N/O, the contact between COM and N/O is normally open, and is closed only when the output is active.
- If you connect to N/C, the contact between COM and N/C is normally closed, and is opened only when the output is active.

See Figure 13 for an example.

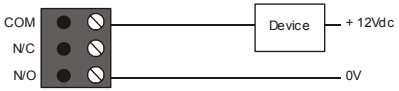


Figure 13: Example of using a relay programmable output

External Bell/Sounder Connections

("9" in Figure 2.)

If required, an external sounder can be connected to the control panel. Connection details are shown in Figure 14.

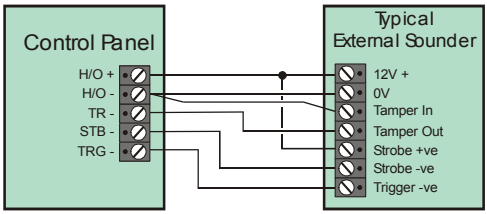


Figure 14: External Sounder Connections

The meaning of each terminal is as follows:

H/O+ This is used to provide a permanent +ve hold off to external sounders, strobes, etc.

H/O - This is used to provide a permanent -ve hold off to external sounders, strobes, etc.

TR - This is the negative tamper return connection from the external sounder unit.

STB - This is the strobe trigger output, which switches to 0V on alarm and is rated at 500mA. Normally. this output is connected to the strobe -ve; the strobe +ve is connected to H/O+.

TRG - This is the bell trigger output, which switches to 0V on alarm and is rated at 500mA. This output can be programmed for SAB or SCB operation, and operates as follows:

SAB switches to 0V on alarm and provides a maximum of 500mA.

SCB provides a negative hold off (500mA), which is removed on alarm.

Additional external sounders can be driven from MSNodes (using an RM3A relay module)

Note that the control unit provides a 14.4V supply for recharging batteries in sounders used in France ("25" in Figure 2).

Auxiliary Tamper Input

("10" in Figure 2.)

The AUX TMP terminals provide a tamper-switch input for an auxiliary device such as a remote power supply unit or extension loudspeaker. If the input is not used, it must be linked out.

Line Fault Input

("11" in Figure 2.)

The system generates a line fault alert if +12Vdc is applied to the LINE FLT input. If the system is unset when this occurs, a "Chime" tone is generated every minute until the condition is reset. If the system is set, any programmed bell delay is cancelled.

Communicator Line Fault

If a standalone communicator, such as a RedCARE STU, is being used, connect the Line Fault output of the communicator to the LINE FLT input of the panel. The communicator must provide +12Vdc to indicate a line fault (e.g. if the Line Fault output at the communicator uses a relay, connect the common terminal of the relay to +12Vdc and the normally-open terminal to the LINE FLT input of the panel).

If the communicator is dual-path (i.e. has landline and mobile communication), you also need to connect a panel output programmed as type "ATS Test" to the ATS Test input of the communicator. Invert the sense of the output at the panel if a "positive applied" input sense is used at the communicator.

The panel generates an "ATE L.F. Single" alert if only one of the networks is not available, or "ATE L.F. All" if both networks are not available. For a single-path communicator, a line fault generates "ATE L.F. All".

Remote Reset Input

("12" in Figure 2.)

For alarms that require an engineer or remote reset, the system can also be reset by applying 0Vdc to the REM RST input terminal. This can be achieved by routing 0V from terminal block "16" (Figure 2) through a switch to the REM RST input.

This input could be connected to the "Control" output from a RedCARE Subscribed Terminal Unit (STU) to enable the central station to provide a "Remote Reset" facility.

Extension Loudspeaker Connections

("13" in Figure 2.)

An extension loudspeaker can be connected to the SPKR terminals of the control panel. Connection details are shown in Figure 15.

The speaker output is designed to drive up to two 16Ω loudspeakers. However, when using two speakers, you must wire them in series to reduce current consumption.

Each loudspeaker output can also be programmed to one or more wards so that the sounder only operates under the relevant conditions.

Note: Extension loudspeakers MUST NOT be wired in the same cable as used for network or zone wiring.

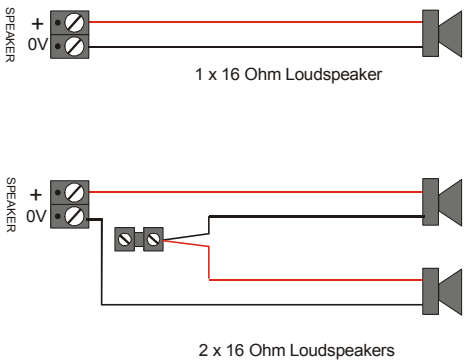


Figure 15: Extension Loudspeaker Connections

AC Input Connector

("14" in Figure 2.)

The two outer terminals of the AC IN connector connect to the 20VAC output from the mains transformer.

Battery Connector

("15" in Figure 2.)

Note: Do not connect the battery until all other wiring has been completed.

The BATT terminals are for connection to a +12Vdc standby battery. A battery lead is provided in the spares pack (red wire to "+").

Figure 16: Battery Connections

If the mains power to the control panel fails, the standby battery will take over and maintain the system. In order to safeguard the battery from full discharge, the control panel automatically isolates the standby battery when its voltage falls below 9.5V. When the mains power is restored, the system will power-up and continue to recharge.

12Vdc Auxiliary Power Terminals

("16" in Figure 2.)

You can use the terminal block in the bottom-left corner of the control panel PCB to power devices such as PIR detectors. The terminals provide 12Vdc.

Back Tamper Connector

("17" in Figure 2.)

The BACK TAMPER connector should be wired to the "back tamper switch", which is mounted on a plate that slides into slots shown in Figure 1. The switch enables the system to generate a tamper alarm if the lid of the control panel is removed or if the control panel is removed from the wall.

Factory Restart Connector

("18" in Figure 2.)

If the pins of the FACTORY RESTART connector are shorted during power-up, all system parameters are reset to their factory default settings, including the engineer passcode, as documented in the *M2000/M800/M750 Engineering Manual*.

Ensure that the terminals remain shorted until the heartbeat LED (LED1) flashes.

Momentarily shorting the terminals with power already applied defaults only the engineer passcode.

Note: This procedure will not work if an installer has locked the NVM using option within the Installer

Menu. If you lock the NVM DO NOT forget the engineer passcode.

Serial Printer Connector

("19" in Figure 2.)

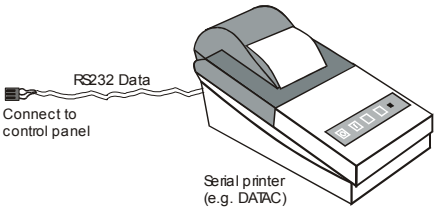


Figure 17: Using a Printer

The SERIAL PRINTER connector enables a serial (RS232) printer to be connected directly to the control panel, such as a DATAC printer. Connection details are shown in Figure 18.

The printer can, for example, be used to:

- Produce a hardcopy record of system programming details.
- Print logged events. The system can be configured to enable online printing, where logged events are automatically printed as they occur.

The printer must be set up with the following communication settings: 4800 baud, eight data bits, one stop bit, one start bit, no parity and DTR normal.

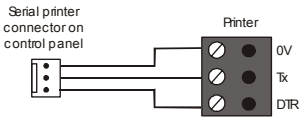


Figure 18: Printer Connections

Output Module Connector

("20" in Figure 2.)

CPA6 output modules (now obsolete) can be connected to the OUTPUT MODULE connector to provide eight additional 100mA switched-negative programmable outputs per module. The outputs can be used to drive LEDs or other low-power devices (see Figure 19).

Each output module is supplied with an interface lead, which enables easy connection to the control panel (or to an MSNode).

When the output module is connected to the control panel, the outputs can be programmed to indicate ward status or zone alarms.

For further details, please refer to the CPA6 Output Module Installation Instructions.

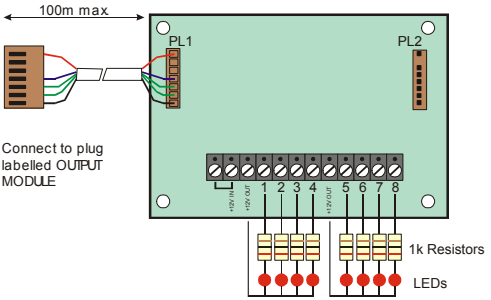


Figure 19: Output Module Connections

Engineer Keypad Connector

("21" in Figure 2.)

A keypad set with its ID selector switch set "ENG" can be connected directly to the ENGINEERS KEYPAD connector on the control panel, using the Engineer Keypad Interface (EKI) lead. (Figure 20 provides connection details.)

An engineer's keypad is intended to be temporary connected to the control panel for system configuration and testing at the control panel. The keypad can be disconnected without causing an alarm. Once a system has been set up, system configuration should normally be carried out from a keypad attached to Network 1 or 2.

The zone and output terminals on an engineer's keypad cannot be used.

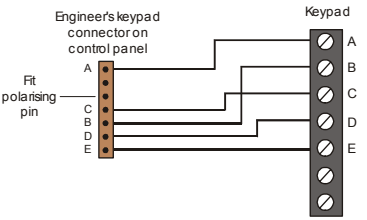


Figure 20: Engineer Keypad Connections

Serial Connection to PC

("22" and "23" in Figure 2.)

Optionally, a local PC running the Menvier Downloader software can be connected to the control panel for system configuration and data uploading. The PC can connect to the panel's USB port ("22" in Figure 2) or Serial RS232 port ("23" in Figure 2).

When using the RS232 port, use a null-modem serial cable – wiring details are shown in Figure 21.

A serial or USB port cannot be used to connect a printer.

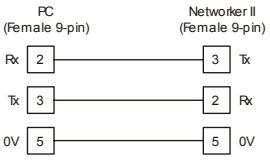


Figure 21: RS232 Connections to a PC

Power Availability

Before connecting any external devices to the control panel, you must make sure that the control panel can provide sufficient current to power them.

The amount of current available from the panel depends on the standard and grade in use, the battery fitted, and (for Grade 3 only) whether AC Fails are transmitted to an ARC. See Table 2 or3.

Using 4, calculate the total current taken by all devices used (except the battery), and make sure that this does not exceed the available current.

If the total current required exceeds the amount available, add more power supplies.

Fitted Battery Size	Available Current Grade 1 or 2
7Ah	580mA
17Ah	750mA

Table 2: Available Current - Grade 1 or 2, PD6662 or EN50131-1

	Available Current Grade 3			
	AC Fail to ARC		No AC Fail to ARC	
Fitted Battery Size	PD6662 Grade 3	EN50131-1 Grade 3	PD6662 Grade 3	EN50131-1 Grade 3
7Ah	580mA	230mA	290mA	Not valid
17Ah	750mA	560mA	700mA	280mA

Table 3: Available Current - Grade 3, PD6662 or EN50131-1

Device	Current
Control panel PCB	200mA
Extension loudspeaker ("13" in Figure 2), if used	100mA
Bell ("9" in Figure 2)	Device dependent
Devices powered from digital communicator and transistor outputs ("8" and "6" in Figure 2)	Device dependent
Each PIR or other device powered from the 12Vdc output ("16" in Figure 2)	Device dependent

Each keypad:	
MKP1	90mA
MKP2	80mA
Each ID Node/MIDNode	160mA(max)
Each MSNode (non-alarm state excl. speaker)	60mA
Each MSNode (alarm state incl. spkr, max.)	310mA
Each MRNode	55mA
Each output module	5mA
Each LEC2	40mA

Table 4: Current Consumption Figures

Connecting to the Mains Supply

WARNING: ENSURE THAT THE MAIN SUPPLY IS DISCONNECTED AND ISOLATED BEFORE MAKING ANY MAINS CONNECTIONS.

All mains electrical connections must be carried out by a qualified electrician and must comply with the current local regulations (e.g. IEE). The supply must be fed from an un-switched fused spur fitted with a 3A fuse.

The unit shall be installed incorporating a disconnect device which has a 3mm air contact separation in all poles.

The mains supply is connected to a 3-way "Euro Type" fused terminal block (see Figure 22). Ensure that the earth wire is longer than the live and neutral to ensure that the earth is the last to take any strain.

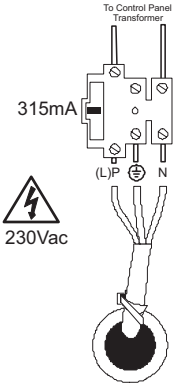


Figure 22: Mains Connections

Note: To avoid mains interference, the mains cable must enter the control panel through its own cable entry hole (see Figure 1) and must not be mixed with other cables.

The mains cable must be anchored down with a strain-relief tie. There is a eye located to the top-left of the mains cable entry hole for this purpose.

LEDs

The LEDs (see Figure 2) have the following meanings:

- LED1 (heartbeat) – Flashes once per second to indicate that the panel is operating. The LED flashes rapidly after a reset.
- LED2 (network 1 fuse) – Monitors the polyfuse for network 1. When illuminated, the LED indicates that the 12V supply to network 1 is open circuit.
- LED3 (network 2 fuse) – Same as LED2, but for network 2.
- LED4 (PSTN) – Illuminates when there is activity on the PSTN port.
- LED5 (power) – Illuminates when the panel is energised (either from the AC input or from the battery).
- LED6 (12V output fuse) – Monitors the polyfuse protecting the 12Vdc output from the terminal block labelled "16" on Figure 2.
- LED7 (Bell output fuse) – Monitors the polyfuse protecting the bell output labelled "9" on Figure 2.
- LED8 (relay 1 status) – Illuminates when relay 1 is energised.
- LED9 (relay 2 status) – Illuminates when relay 2 is energised.
- LED10 (transistor output 3 status) – Illuminates when transistor output 3 is active.
- LED11 (transistor output 4 status) – Illuminates when transistor output 4 is active.
- LED12 (strobe output status) – Illuminates when the strobe output is active.
- LED13 (bell output status) – Illuminates when the bell output is active.
- LED14 (transistor output 5 status) – Illuminates when transistor output 5 is active.

Polyfuses

The PCB contains the following automatically-resettable polyfuses. Note that to reset a polyfuse, the load must be removed completely.

- F1 – Battery load circuit (the on-board circuit that periodically monitors the health of the battery).
- F2 – Network 1 12Vdc output.
- F3 – Network 2 12Vdc output.
- F4 – Extension loudspeaker.
- F5 – 12Vdc output from the 12V terminals on the terminal block labelled "16" on Figure 2.
- F6 – Bell output on the terminal block labelled "9" on Figure 2.

Electromagnetic Compatibility

When used as intended this product complies with EMC Directive (89 /336 /EEC). Any modifications other than those stated in this manual, or any other use of this product may cause interference and it is the responsibility of the installer to comply with the EMC and Low Voltage Directives.

Technical Specifications

Environmental	Class II
Security	EN50131-1 or PD6662 Grade 1, 2 or 3. See page 14.
Mains Supply:	145mA @ 230Vac±10%, 50Hz
PCB Power Supply:	13.65VDC, 1.5A A maximum of 750mA is available for the control panel PCB and other devices (excluding battery recharge)
Standby Battery:	12VDC, lead-acid. See page 14 for further details.
Charging limit:	750mA
Recharge time:	24 hrs max. for 17AH battery
Zones:	8 on-board zones, expandable to 264
Network 1 or 2:	Max of 16 MSNodes/MRNodes/MSPSUs, 5 keypads/LEC2s, 4 MIDNodes, or 2 IDNodes per network
Additional ports:	Engineer's keypad port USB and RS232 ports to PC Printer (RS232) port PSTN/RJ11 for phone connection Output module port
Relay Outputs:	2 voltage-free changeover 1A max @ 24Vac or 24Vdc
Transistor Outputs:	2 Switched -ve @500mA 1 Switched +ve @500mA
Digi Outputs 1-16:	Source 5mA in 12V condition Sink 100mA in 0V condition Selectable output sense
REN Value:	0.2
Speaker Output:	16 Ohms
Bell Trigger:	Switched -ve @500mA
Strobe Trigger:	Switched -ve @500mA
Mains Input Fuse:	T315mA 250V 20mm
Dimensions:	384(W), 312(H), 95(D) mm
Material:	1.2mm mild steel
Weight:	4.9 Kg
Environment:	-10 to 40°C
Humidity	0 to 75% RH, non-condensing.

Standards: EN 50131-1, PD 6662, TS 50131, BS4737, EN 50130.

This equipment is compliant with EN 50136-2-1 & EN 50136-2-2. It allows the alarm transmission system to meet the performance requirements of prEN50131-1: 2004 ATS 2 provided that:

a) It is installed in accordance with the installation instructions.
b) The connected PSTN is functioning normally.
c) The ARC is adequately equipped.